AMENDMENT AND PRESENTATION OF CLAIMS

Please replace all prior claims in the present application with the following claims.

1.   (Currently Amended)   A method for supporting frame synchronization in a digital communication system, the method comprising the steps of:

mapping a codeword specifying framing information of a frame according to a signal
   constellation to output a data stream;

duplicating and demultiplexing the data stream into a first data stream and a second data
   stream that are the same as each other;

modifying the first data stream according to a predetermined operation;

multiplexing the modified first data stream with the second data stream to form a frame
   synchronization structure in the multiplexed data streams; and

outputting a physical layer signaling header corresponding to the frame based on the
   multiplexed data streams.

2.   (Original)   A method according to claim 1, wherein the signal constellation is independent of a modulation scheme of the frame.

3.   (Original)   A method according to claim 1, wherein the frame is a Low Density Parity Check (LDPC) coded frame.

4.   (Original)   A method according to claim 1, wherein the predetermined operation includes multiplying the first data stream with {-a,} or { a}, a being a predetermined constant.

5.   (Currently Amended)   A method for supporting frame synchronization in a digital communication system, the method comprising the steps of:

mapping a codeword specifying framing information of a frame according to a signal
   constellation to output a data stream;

duplicating and demultiplexing the data stream into a first data stream and a second data
   stream that are the same as each other;

modifying the first data stream according to a predetermined operation that includes

multiplying the first data stream with $\{-a,\}$ or $\{a\}$, a being a predetermined constant,

wherein the sign of the multiplier represents a portion of the framing information;

multiplexing the modified first data stream with the second data stream to form a frame

synchronization structure in the multiplexed data streams; and

outputting a physical layer signaling header corresponding to the frame based on the

multiplexed data streams.

6.   (Currently Amended)   A method for supporting frame synchronization in a digital communication system, the method comprising the steps of:

mapping a codeword specifying framing information of a frame according to a signal

constellation to output a data stream;

duplicating and demultiplexing the data stream into a first data stream and a second data

stream that are the same as each other;

modifying the first data stream according to a predetermined operation, wherein bits of

the first data stream are interleaved with respective additional bits, the additional bits

being phase rotated relative to the bits of the first data stream during modulation;

multiplexing the modified first data stream with the second data stream to form a frame

synchronization structure in the multiplexed data streams; and

outputting a physical layer signaling header corresponding to the frame based on the

multiplexed data streams.

7.   (Original)   A method according to claim 1, further comprising the step of:

generating the codeword according to a first order Reed-Muller code.

8.   (Original)   A method according to claim 1, wherein the framing information specifies a modulation scheme, and a coding scheme.

9.   (Original)   A method according to claim 1, further comprising the step of:

scrambling the multiplexed data streams.

10.   (Original)   A method according to claim 1, wherein the signal constellation is according to a Binary Phase Shift Keying (BPSK) scheme.

11.   (Original)   A computer-readable medium bearing instructions for supporting frame synchronization in a digital communication system, said instruction, being arranged, upon execution, to cause one or more processors to perform the method of claim 1.

12.   (Currently Amended)   An apparatus for supporting frame synchronization in a digital communication system, the apparatus comprising:

   a constellation mapper configured to map a codeword specifying framing information of a frame according to a signal constellation to output a data stream, wherein the data stream is demultiplexed into a first data stream and a second data stream that are the same as each other;

   a multiplier coupled to the constellation mapper and configured to modify the first data stream; and

   a multiplexer configured to combine the modified first data stream with the second data stream to form a frame synchronization structure in the multiplexed data streams, wherein a physical layer signaling header corresponding to the frame is output based the multiplexed data streams.

13.   (Original)   An apparatus according to claim 12, wherein the signal constellation is independent of a modulation scheme of the frame.

14.   (Original)   An apparatus according to claim 12, wherein the frame is a Low Density Parity Check (LDPC) frame.

15.   (Original)   An apparatus according to claim 12, wherein the multiplier multiplies the first data stream with {-a,} or { a}, a being a predetermined constant.

16.   (Currently Amended)   An apparatus for supporting frame synchronization in a digital communication system, the apparatus comprising:

a constellation mapper configured to map a codeword specifying framing information of a frame according to a signal constellation to output a data stream, wherein the data stream is demultiplexed into a first data stream and a second data stream that are the same as each other;

a multiplier coupled to the constellation mapper and configured to modify the first data stream by multiplying the first data stream with {-a,} or { a}, a being a predetermined constant, wherein the sign of the multiplier represents a portion of the framing information; and

a multiplexer configured to combine the modified first data stream with the second data stream to form a frame synchronization structure in the multiplexed data streams, wherein a physical layer signaling header corresponding to the frame is output based the multiplexed data streams.

17.   (Currently Amended)   An apparatus for supporting frame synchronization in a digital communication system, the apparatus comprising:

a constellation mapper configured to map a codeword specifying framing information of a frame according to a signal constellation to output a data stream, wherein the data stream is demultiplexed into a first data stream and a second data stream that are the same as each other;

a multiplier coupled to the constellation mapper and configured to modify the first data stream, wherein bits of the first data stream are interleaved with respective additional bits, the additional bits being phase rotated relative to the bits of the first data stream during modulation; and

a multiplexer configured to combine the modified first data stream with the second data stream to form a frame synchronization structure in the multiplexed data streams, wherein a physical layer signaling header corresponding to the frame is output based the multiplexed data streams.

18.   (Original)   An apparatus according to claim 12, further comprising:

a code generator coupled to the constellation mapper and configured to generate the codeword according to a first order Reed-Muller code.

19.   (Original)   An apparatus according to claim 12, wherein the framing information specifies a modulation scheme, and a coding scheme.

20.   (Original)   An apparatus according to claim 12, further comprising:

a scrambler configured to scramble the multiplexed data streams.

21.   (Original)   An apparatus according to claim 12, wherein the signal constellation is according to a Binary Phase Shift Keying (BPSK) scheme.

22 - 49. (Canceled)

50.   (Previously Presented)   A method according to claim 1, wherein the data stream includes a unique word to assist with synchronization.

51.   (Previously Presented)   An apparatus according to claim 12, wherein the data stream includes a unique word to assist with synchronization.